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ABSTRACT

This report discusses the results of the third year--1998-99--of California's Class Size Reduction (CSR) program. Assessments of the program show that CSR was almost fully implemented by 1998-99, with over 92 percent of students in K-3 in classes of 20 or fewer students. Those K-3 classes that had not been reduced in size were concentrated in districts serving high percentages of minority, low-income, or English-learner (EL) students. The average qualifications of California teachers declined for all grade levels, but the declines were worse in elementary schools. Although the qualifications of K-3 teachers continued to decline, it was at a slower rate than in the past. Declines in teacher qualifications were mirrored in grades 4 and 5. Curriculum and instruction were mostly similar regardless of class size, though teachers in reduced-size classes spent more time working individually with students during mathematics and language arts lessons than did their counterparts in nonreduced-size classes. Student achievement did improve in the reduced-size classes, and these positive gains were evident with all students, regardless of their backgrounds. These positive effects continued in grade 4 and regular-size classes. Finally, programs serving EL students and special-education students were affected by the transfer of teachers from these areas into regular classes. (RJM)

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Class Size Reduction in California:

Summary of the 1998–99 Evaluation Findings

This summary has been extracted from the CSR Research Consortium's second evaluation report, *Class Size Reduction in California: The 1998–99 Evaluation Findings.*

JUNE 2000

Since we first reported on California's Class Size Reduction (CSR) program in June of last year, the national interest in reducing the size of classes in America's schools as a way to improve education has continued to grow. During the current school year (1999–2000), federal funds for reduced size classes became available for the first time, additional states initiated reduction programs, and California's CSR effort approached full implementation. In addition, expectations about the benefits of reduced size classes have remained high, partly because ongoing analyses of Tennessee's Student/Teacher Achievement Ratio (STAR) project found that the benefits of small classes in kindergarten through third grade are sustained well into high school.

Last year's CSR report,[1] the first in a planned series of four, presented our evaluation of the first two years of the CSR program—1996–97 and 1997–98.[2] We documented what turned out to be an extremely rapid implementation of reduced size classes in California's schools and confirmed that third-grade students in reduced classes did indeed perform better on achievement tests than third graders in non-reduced classes, although the difference was small. However, we also pointed out that the program was just beginning and that its implementation had been uneven, with those most in need—minority students, students from low-income families,[3] and students not fully proficient in the English language[4]—being least likely to be in reduced size classes. Furthermore, the need for teachers grew as program implementation proceeded, resulting in many less-qualified teachers being hired into the school system. And the greatest increases in the number of teachers with lower qualifications were seen in schools with high proportions of the same groups of historically disadvantaged students.

In this second report in the series, we revisit our earlier findings as we examine what happened during 1998–99, the third year of the program. Our major findings for 1998–99 can be summarized as follows:

- The CSR program was almost fully implemented by 1998–99. Over 92 percent of California students in kindergarten through third grade (K–3) were in classes of 20 or fewer.

- K–3 classes that had not been reduced in size were concentrated in districts serving high percentages of minority, low-income, or English learner (EL) students.

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[1] Bohrnstedt, G.W., & Stecher, B.M. (Eds.). (1999). *Class size reduction in California: Early evaluation findings, 1996–1998.* (CSR Research Consortium, Year 1 Evaluation Report). Palo Alto, CA: American Institutes for Research.

[2] Evaluation efforts were not funded until the second year of the CSR program, so the first report covered both the first and second years.

[3] Students are referred to as low-income or as being from low-income families in this report if state records classify them as receiving public assistance in the form of Aid to Families with Dependent Children (AFDC) or its successor in California, CalWORKS.

[4] Students for whom English is a second language and who are not fully proficient in English are often referred to as limited English proficient (LEP), English language learners (ELL), or English learners (EL). We use EL throughout this year's report because tis is the term used in the California law that implemented Proposition 227. Passed by the voters of California in 1998, Proposition 227 banned the implementation of bilingual education except under special parental waiver conditions.

- The average qualifications (that is, education, credentials, and experience) of California teachers declined during the past three years for all grade levels, but the declines were worse in elementary schools.

- The qualifications of K–3 teachers continued to decline in this third year of the CSR program, but at a slower rate than in the past; and schools serving low-income, minority, or EL students continued to have fewer well-qualified teachers than did other schools. Moreover, the declines in teacher qualifications observed in K–3 during the program's first three years were mirrored in grades 4 and 5, as were the inequities between schools in terms of teacher qualifications.

- Curriculum and instruction were generally similar regardless of class size. However, teachers in reduced size classes spent more time working individually with students during mathematics and language arts lessons than did their counterparts in non-reduced size classes. The added individual work included doing more frequent sustained work with individual students who were having reading problems.[5] Also, students in reduced classes were less disruptive during lessons than were students in non-reduced classes.

- There was again a small positive gain in student achievement associated with being in a reduced size class, as measured in grade 3, and this gain was realized equally by all students, regardless of their background characteristics. For students who had been in a reduced class in grade 3 in 1997–98, this small positive effect persisted even after they returned to a non-reduced size class in grade 4.

- Programs serving EL students and special education students were further affected by transfers of teachers from these areas into regular classes.

These findings point to specific issues that educators and policymakers need to address if they are to maximize the benefits of California's CSR program. Our recommendations are presented at the end of this summary.

BACKGROUND

The California program to reduce class size began in 1996 when California's state legislature passed SB 1777, a reform measure aimed at cutting class size in the early school grades from what had been an average of 28 students to a maximum of 20. To our knowledge, the CSR initiative was and still is the largest state educational reform in history: This voluntary program currently costs over $1.5 billion per year and affects over 1.8 million students. In 1998–99, the year covered by this report and the third year of the program, California school districts that chose to participate received just over $800 for each K–3 student enrolled in a class of 20 or fewer students.

[5] Sustained individual work means five or more consecutive minutes of assistance.

The high expectations educators and policymakers hold for the program are based in large part on the results of a class size reduction experiment conducted in Tennessee from 1985 to 1990. Known as the Tennessee STAR (Student/Teacher Achievement Ratio) project, this educational improvement effort produced relatively large achievement gains for all students, as measured by their scores on the Stanford Achievement Test (SAT-9). Moreover, the gains for low-income and minority students were almost twice as large as those for other students.

However, there are substantial differences between Tennessee's and California's situations, and one cannot assume that the CSR program will automatically produce the same or better results for California's students. The Tennessee program was a carefully controlled experiment involving about 10,000 students, whereas the California program is implemented statewide and serves 1.8 million students. Another difference is that California's program reduces its maximum class size of 33 students down to 20, whereas Tennessee took its class size of 22–26 students down to 13–17. California also serves a student population that is decidedly more ethnically and linguistically diverse. Finally, California schools lack two important ingredients that Tennessee schools did not—adequate space and enough qualified teachers for program implementation. These differences between the two programs are large. When considered together, they clearly indicate that California's CSR program must be judged on its own terms rather than as a replication of the Tennessee experiment.

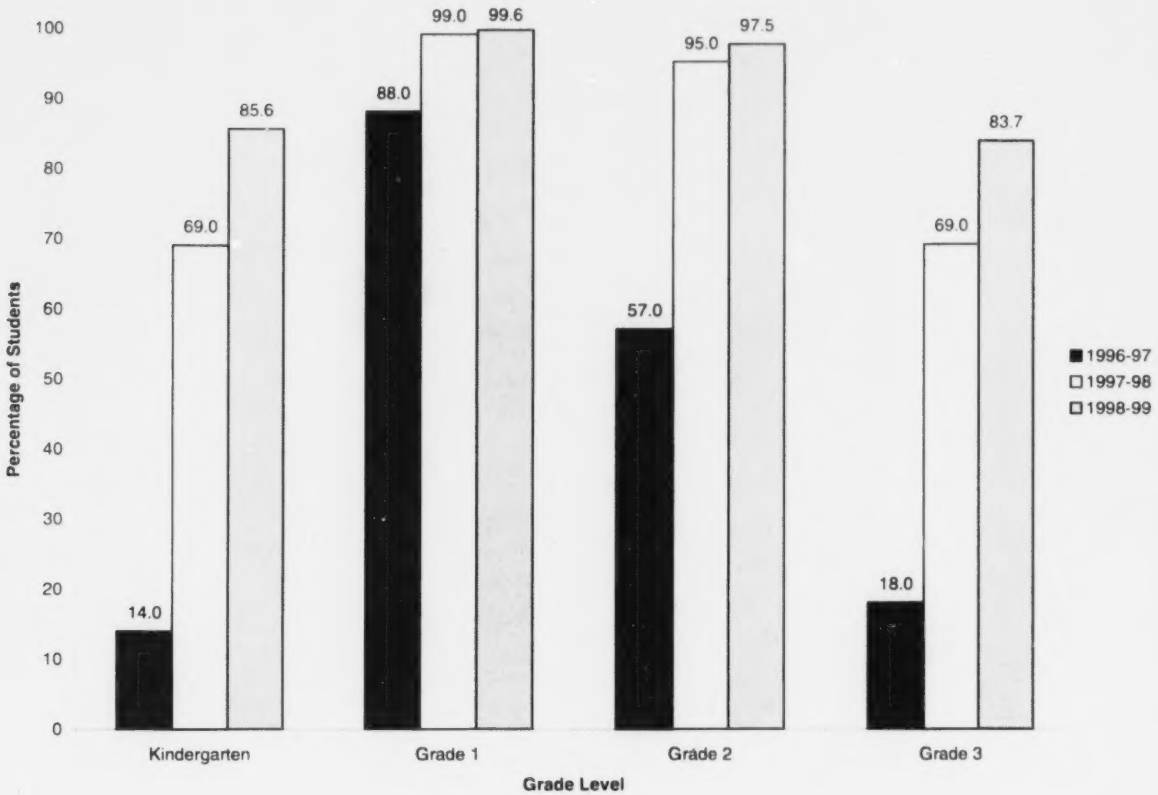
It is also important to understand that the CSR program is not being implemented within a static system. California's schools are undergoing numerous other major educational reforms that involve changes in curriculum standards, state assessments, bilingual education guidelines, teacher certification procedures, and student promotion policies. These interventions and others interact in intricate and complex ways, making it difficult to attribute changes to any single effort, including the CSR program.

RESULTS

CSR is Nearing Full Implementation

By the end of the third year of CSR (the 1998–99 school year), 98.5 percent of all eligible districts were participating in the program, and 92 percent of California's K–3 students were in reduced size classes (see Figure 1). In other words, CSR had been implemented in about 94,000 classes serving nearly 1.8 million students. This represents an increase over the second year of implementation, when 84 percent of California's K–3 students received instruction in reduced classes. And because the law required that districts first reduce class size in grades 1 and 2, the growth in 1998–99, as might be expected, occurred primarily in kindergarten and grade 3.

Figure 1—
CSR Implementation Over First Three Years of Program



Source: California Department of Education. Retrieved February 24, 1999, from the World Wide Web: http://www.cde.ca.gov/ftpbranch/sfpdiv/classize/facts.htm.

Moreover, 1998–99 saw the elimination of the gap in the extent to which CSR had been implemented in schools serving high versus low percentages of low-income students. And there was a considerable narrowing of the gap between schools serving high and low percentages of minority or EL students.

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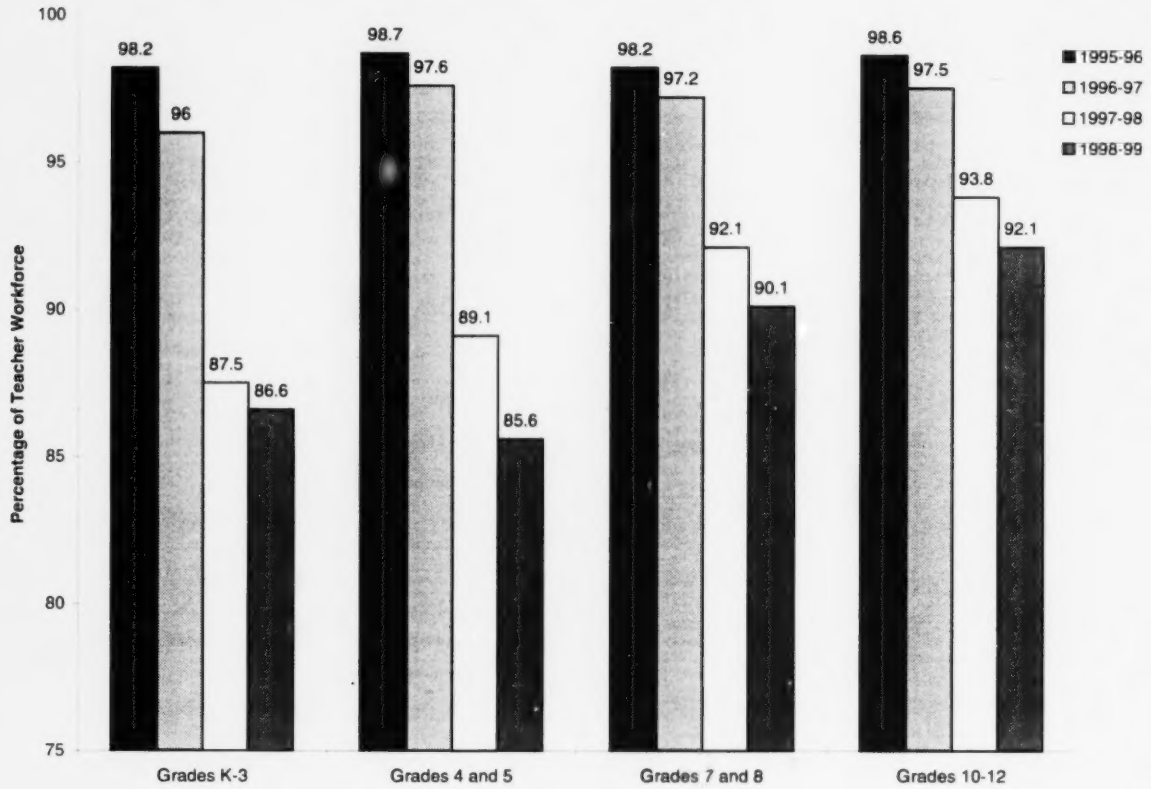
Even so, there were still some non-reduced classes (primarily in kindergarten and grade 3), and they were concentrated in schools serving high percentages of Hispanic students. For example, schools whose student body was less than 15 percent Hispanic had 95 percent of their third graders in reduced classes, whereas schools with 45 percent or more Hispanic students had 80 percent of their third graders in the smaller classes. That's a difference of 15 percentage points. The comparable gap at the kindergarten level was 11 percentage points.

Teacher Qualification Levels Declined in Grades K–12, But the Decline Was Greatest in the Elementary Grades

While CSR was being implemented, the qualifications of California's teacher workforce declined. The proportion of teachers with full credentials decreased in all grades (see Figure 2), as did the proportion of teachers with the minimum level of college education (only a bachelor's degree) and the proportion of experienced teachers (those with more than three years of experience). A number of factors, including the booming state economy and increasing enrollments may have been responsible for this decline.

But the problem of underqualified teachers was greatest in elementary schools, where CSR created the greatest increase in demand. The decline in qualification levels of the K–3 teacher workforce that we described in last year's report continued in 1998–99, although at a much slower pace. And the changes in the teacher workforce that we saw for K–3 were mirrored in grades 4 and 5. That is, the proportions of teachers who were fully credentialed, had college training beyond a bachelor's degree, or had more than three years of experience decreased for grades 4 and 5 at the same rate they decreased for K–3.

Figure 2—
Percentage of Fully Credentialed Teachers, 1995 to 1999

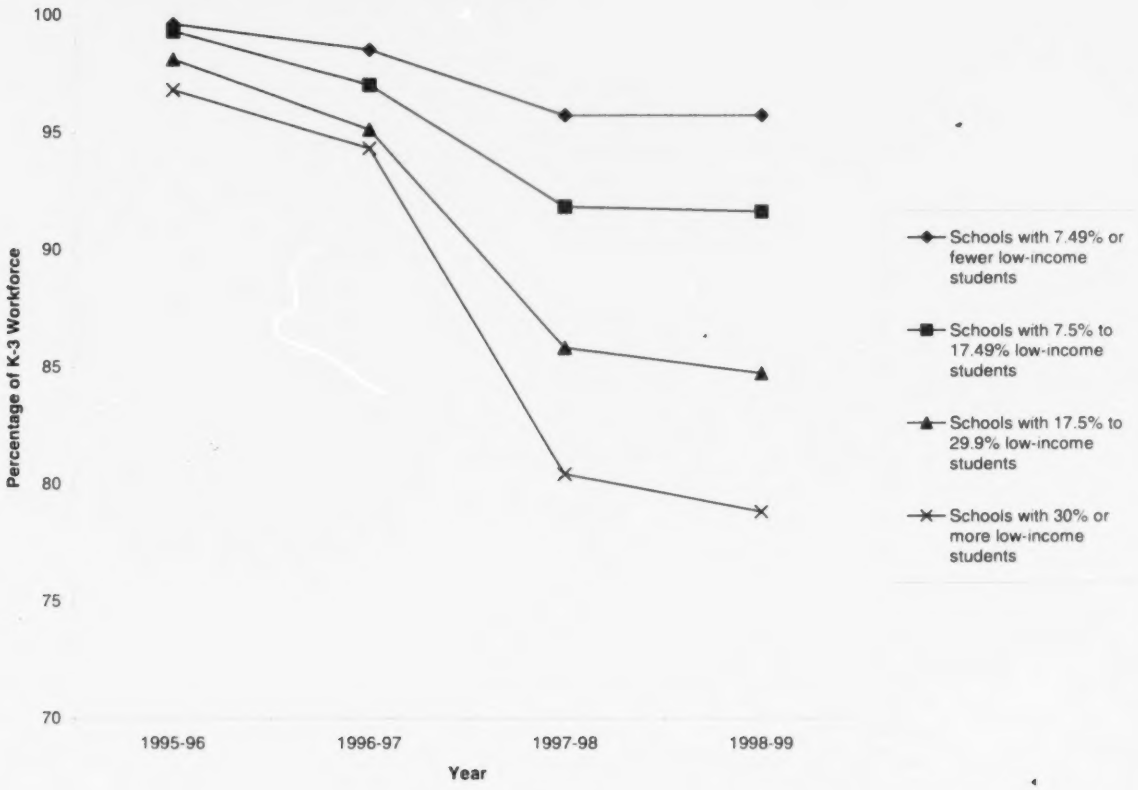


Source: CSR Consortium analysis of California Department of Education, California Basic Education Data System–Professional Assignment Information Form (CBEDS-PAIF) data.

Decline in Teacher Qualifications Was Greatest in Schools Serving Students Most in Need

The decline in teacher qualifications was greater in elementary schools serving low-income, EL, or minority students than in other schools (see Figure 3). Elementary schools serving the fewest low-income students saw the proportion of fully credentialed K–3 teachers decrease from 98 to 96 percent from 1995–96 to 1998–99, while schools serving the most low-income students saw the proportion of qualified K–3 teachers decrease from 96 to 80 percent. In 1998–99, the rapid decrease in qualified teachers that happened in the first three years was halted for schools with fewer low-income students, but it continued, though more slowly, for schools with more low-income students.

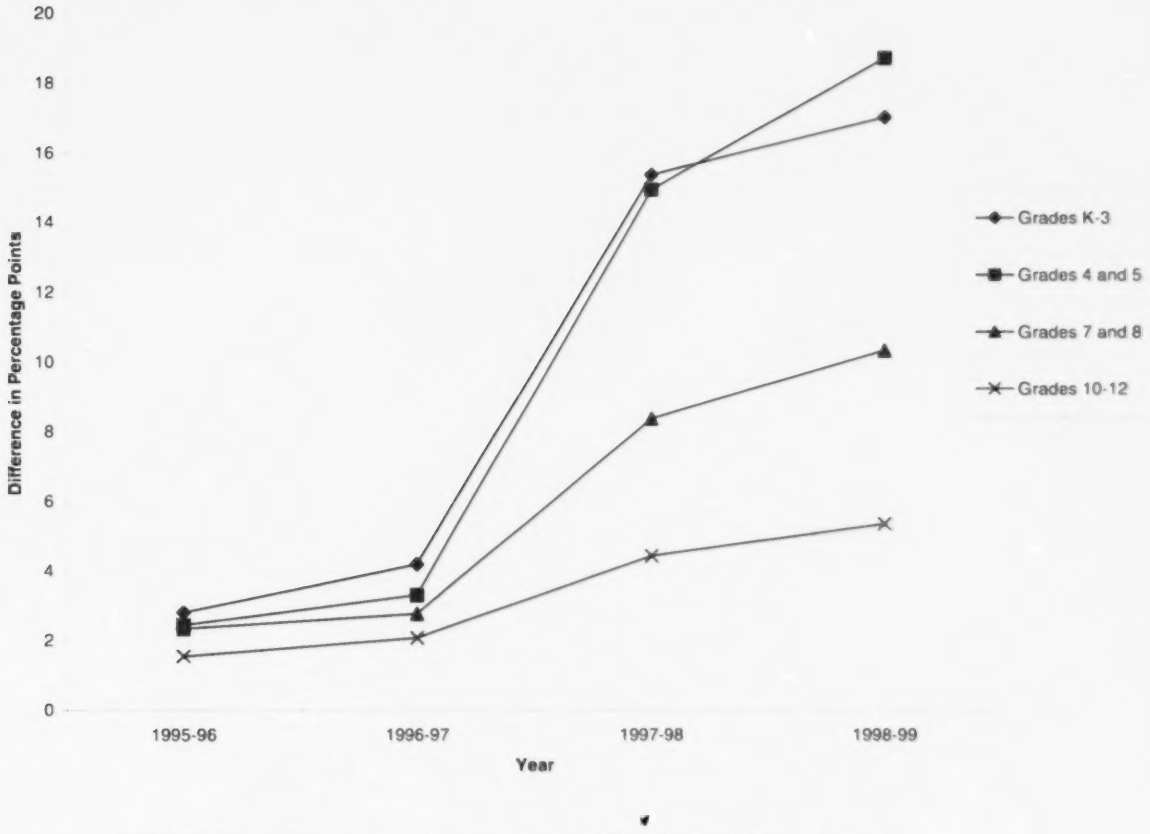
Figure 3—
Percentage of K–3 Teachers Fully Credentialed In Schools with Different Proportions of Low-Income Students



Note: Differences between the top and bottom quartiles in the same years are statistically significant at the 0.01 level.
Source: CSR Consortium analysis of California Department of Education, CBEDS-PAIF data.

The uneven decline in teacher qualifications seen in grades K–3 occurred to a lesser extent in all grade levels, K–12. This is illustrated by dividing all schools into four groups based on the percentage of low-income students, and looking at the gap in teacher qualifications between the top and bottom groups (see Figure 4). At every grade level, there was a difference in teacher qualifications between schools with high percentages of low-income students and schools with low percentages of low-income students, and these differences increased from 1995–96 to 1998–99. These gaps were greatest in the elementary grades.

Figure 4—
Difference in Percentages of Fully Credentialed Teachers Between Schools with Less Than 7.5% Low-Income Students and Schools with More Than 30% Low-Income Students



Source: CSR Consortium analysis of California Department of Education, CBEDS-PAIF data.

Reduced Size Classes Provided More Individual Instruction But Not Different Curriculum

The survey responses we received from third-grade teachers for 1998–99 were similar to those we had received for the previous school year. They indicate that teachers in reduced size classes, once again, devoted more instructional time to small groups and to working with individual students on mathematics and language arts lessons than did teachers in non-reduced size classes (see Table 1). Moreover, teachers in the smaller classes also continued to provide comparatively more extended attention to poor readers, and were more positive about their ability to assess and meet student needs and to provide students with quick feedback and individual attention. Reduced class size was related to better student discipline in both years as well. In 1997–98, teachers in the smaller classes spent proportionately less time disciplining students than their counterparts in the larger classes

did; in 1998–99, the proportion of students who were disruptive during lessons was smaller in the reduced classes.

Table 1—
Grouping Practices Used by Teachers in Language Arts

	Average Minutes per Day			
	1997–98		1998–99	
Practice	Reduced	Non-reduced	Reduced	Non-reduced
Time with whole class	***38.2***	***43.0***	51.1	50.4
Time with large group (5 or more students)	***26.5***	***32.2***	28.7	34.9
Time with small group (2–4 students)	***20.6***	***15.7***	***23.4***	***14.6***
Time with individuals	16.0	14.0	***18.1***	***11.4***

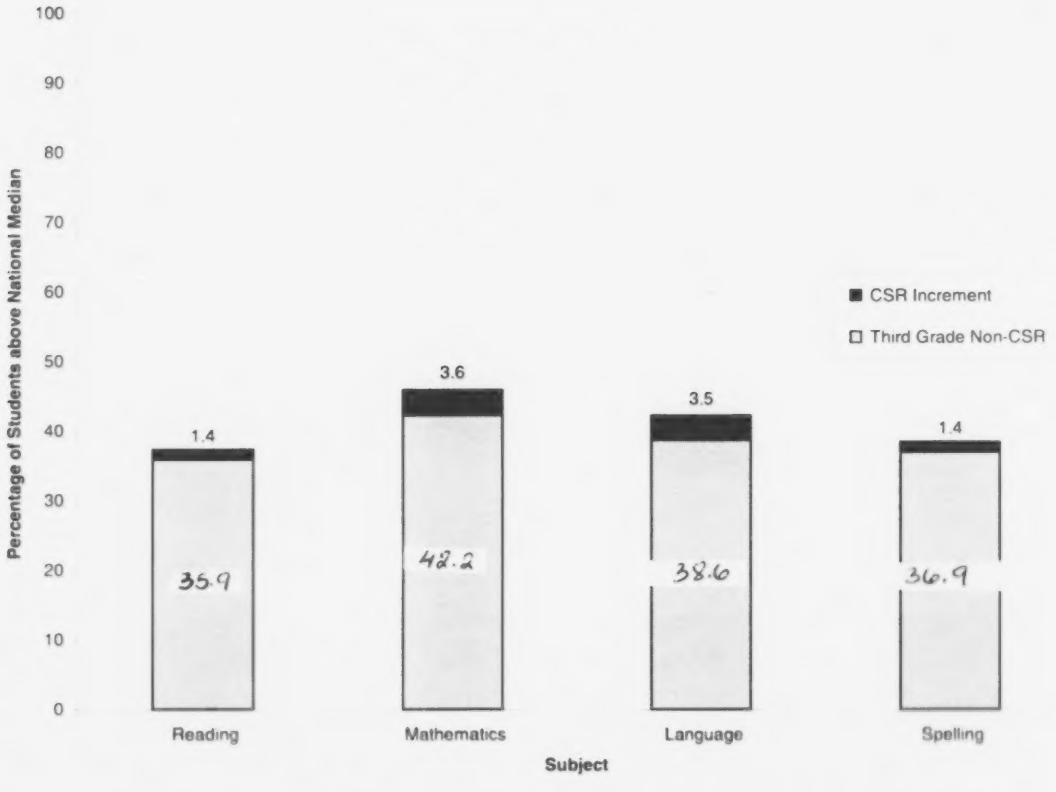
Note: Differences shown in bold italics are statistically significant.
Source: 1998 and 1999 CSR teacher surveys.

However, teachers reported few differences in curriculum, regardless of class size. Teachers in reduced and non-reduced size classes alike covered about the same number of mathematics and language arts topics and devoted about the same amount of time to each major curriculum element. There were no differences between reduced and non-reduced classes in terms of language arts learning activities, and there was only one difference in terms of mathematics: Students in reduced classes worked with measuring instruments in mathematics (e.g., rulers, compasses) more frequently than their counterparts in non-reduced classes did.

Small Improvement in Third-Grade Student Achievement Persisted into Fourth Grade

This year's evaluation and last year's found that third-grade students who were enrolled in reduced size classes performed better than those who were not. This was true in 1997–98, when both of these groups had little or no prior exposure to reduced size classes, and it was true again in 1998–99, when both groups had one to two years of prior exposure to such classes. For 1998–99, we also found that between 1 and 4 percent more third-grade students scored above the national median in schools that had implemented CSR than in schools that had not (see Figure 5).

Figure 5—
Percentage of Third-Grade Students Above 50th National Percentile Rank (Median) With and Without CSR



Moreover, we found that the gains in achievement were similar regardless of a school's student characteristics—that is, regardless of the percentage of minority, low-income, or EL students in the school. This was true in 1997–98 and again in 1998–99.

In addition, there was evidence that the benefits of being in a reduced size class persisted after students returned to a large class for one year. In 1997–98, third-grade students who were in smaller classes had higher scores at the end of the year than did third-grade students who were in larger classes. In 1998–99, both of these groups were in fourth grade and thus in non-reduced size classes. At the end of fourth grade, students who had been in the smaller third-grade classes once again had higher scores than did students who had been in the larger third-grade classes. The difference in achievement at the end of fourth grade was smaller than the difference after third grade, but it was still statistically significant.[6] And the difference was observed whether students in the smaller classes had been in them for third grade alone or for both second and third grade. There

[6] This analysis was based on students who were enrolled at the same school for at least three years.

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were no lasting effects in fourth grade, however, for students who had participated in reduced size classes only in second grade.

When we looked at the state-level results, comparing the whole 1997–98 fourth-grade class that had little or no exposure to reduced size classes with the whole 1998–99 fourth-grade class that had over a year of exposure to CSR on average, we found no differences. We are more likely to see statewide effects from the CSR program in fourth grade in the future, when the total years of exposure will be greater.

CSR and Special Populations

The percentage of students identified as needing special education services was unaffected by CSR, although interviews in six large districts suggested that the number of students referred for special education assessment did increase with the implementation of CSR. However, the CSR program placed additional pressures on services for EL and special education students. As the program grew, many teachers switched from teaching these two groups of students to teaching in regular K–3 classes (see Table 2). Based on reports from superintendents, we estimate that in 1998–99 alone, about 1,000 teachers moved out of these programs and into K–3 classes.

Table 2—
EL and Special Education Teachers Becoming Regular K–3 Teachers from 1995–96 to 1997–98

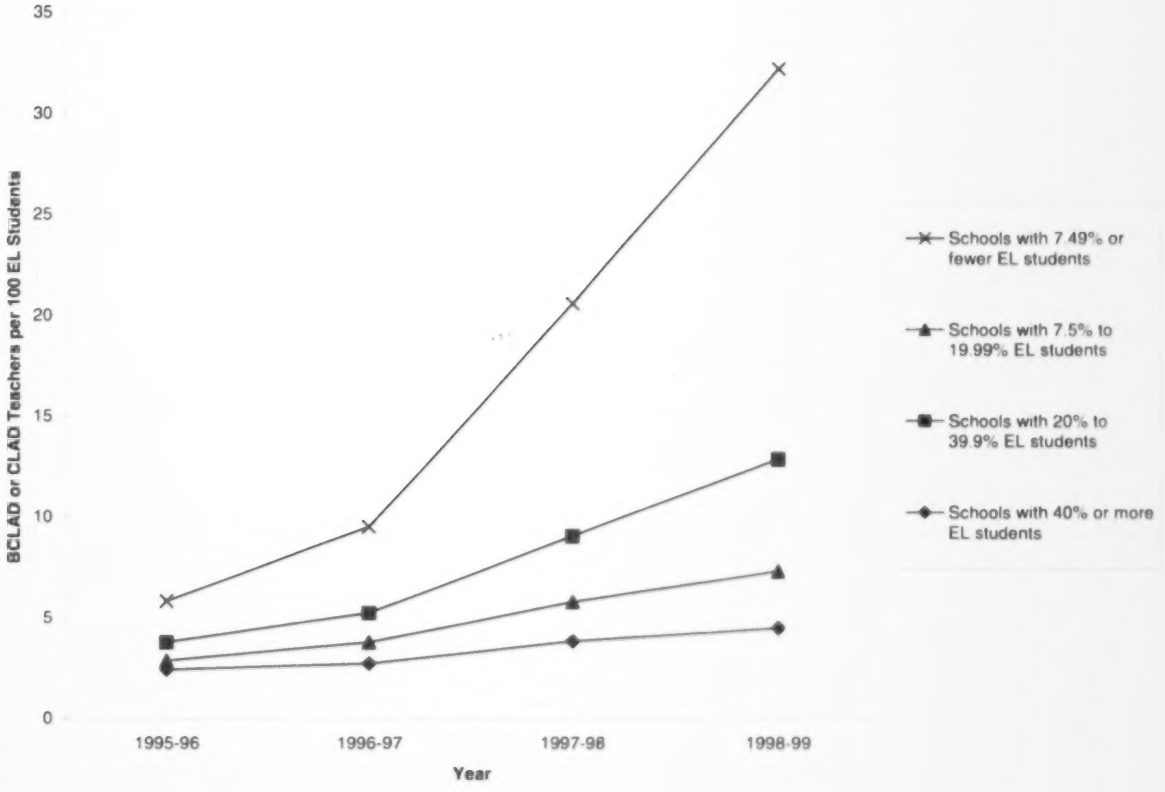
Transfer Type	1995–96	1996–97	1997–98
EL to regular K–3	65	420	509
Special education to regular K–3	165	357	495

Note: Statewide estimates are based on responses to district surveys.

At the same time, more teachers were obtaining extra training to qualify for special certificates to work with minority and bilingual students.[7] Although the proportion of teachers with extra certification increased dramatically during this period, schools serving more EL students received proportionately fewer of these teachers (see Figure 6).

[7] The additional certificates are called Cross Cultural Language and Academic Development (CLAD) and Bilingual Cross Cultural Language and Academic Development (BCLAD) certificates.

Figure 6—
K–3 Teachers with CLAD or BCLAD Credentials in Schools with Different Proportions of EL Students



Source: CBEDS and R-30 Language Census Forms.

IMPORTANT CAVEATS

Some people will see the small positive effect on student achievement associated with the CSR program as good news, particularly given the still early stage of the program's implementation and the difficulties some schools have encountered with implementation. Other people may be disappointed that California's large investment of funds has produced such relatively small effects and that, thus far, the program has not reduced the gap in achievement between low-income, minority, or EL students and other students. We suggest caution in making too strong a judgment about the CSR program's effects on achievement at this early point in time. No one has ever implemented a class size reduction reform on this scale before, and it is difficult to establish criteria for success at this juncture. Additional time and experience are needed if we are to measure the cumulative effects of reduced size classes and to clarify what would be a reasonable standard for success. Students in the Tennessee STAR study had four years of class size

reduction beginning in kindergarten, and no student in California has yet received this much instruction in reduced size classes.

IMPLICATIONS

One of the primary purposes of the CSR evaluation was to let policymakers know whether changes were needed to increase the benefits of the CSR program. Based on our research to date, we can make the following recommendations:

- Stay the course. Policymakers should continue the CSR program in grades K–3 in its basic form to allow the time necessary to realistically assess its impact.
- Address funding and facilities challenges to ensure they do not undermine the effectiveness of the CSR program. Policymakers should
  - periodically review the cost of CSR implementation at the district level and adjust the funding formula to ensure that the support provided for CSR covers the full cost.
  - analyze the funding allocation system for CSR to ensure that it is not leading to educationally unsound teacher or student assignment practices. The funding mechanism must support rational implementation of CSR if the program is going to have the greatest positive effect on student achievement.
  - provide annual cost of living adjustments for the CSR program.
  - take actions to remove the barriers that exist for the 15 percent of California's schools that have not reduced class size in kindergarten or third grade.
  - support state bond measures and other initiatives that help school districts expand, modernize, and maintain their facilities.
- Make sure that all state policies focused on improving California's teacher workforce address the full range of problems, including those exacerbated by the CSR program. Policymakers should
  - ensure that teacher qualifications in grades 4 and 5 are strengthened so that they do not undermine student gains made in K–3.
  - track the early career patterns of novice teachers in reduced K–3 classes to determine the relationship between CSR and early career retention.

- Make CSR in K–3 more effective for the schools and students most in need. Policymakers should

  - target funding designated to improve the qualifications of California's teacher workforce in schools serving low-income, minority, and EL students.

  - establish experimental pilot projects to investigate the benefits of further reductions in class size for low-income, minority, and EL students in the most essential subject areas.

  - continue to monitor the program's implementation to ensure that CSR does not threaten the availability of resources and teachers essential to meeting the needs of special education students.

- Encourage the strategic use of California's federal funds for class size reduction as a way to address the problems identified in this evaluation. Policymakers should

  - explore the use of federal class size reduction funds to complete the implementation of CSR, especially in schools with high percentages of Hispanic students.

  - ensure that any new state or federal CSR initiatives do not exacerbate the existing shortage of qualified teachers.

- Move quickly and boldly to mandate improvements in the state's education data system so that the effects of current reforms can be carefully investigated and future reform efforts can be meaningfully evaluated. Policymakers should

  - require that student identifiers be included on the SAT-9 files retained by the state so that student achievement can be linked across years.

  - develop secure data systems that allow information about teacher qualifications to be linked to student test scores. Qualified researchers can then use these data to help policymakers evaluate the effectiveness of their programs without revealing the identity of teachers and students

  - ensure that the mandated data system benefits both districts and the state by helping districts meet their needs for data and easy local record transfers on students, and by helping the state evaluate and report the success of its programs.

  - provide incentives for schools and districts to cooperate with state efforts to collect additional data. Some states make participation in state-sponsored programs or funding contingent on a school's cooperation with state data collection efforts.

- Evaluate future school reform efforts thoroughly to ensure that California gets the most value for its investments. Policymakers should

  - continue to fund careful evaluations of existing school improvement programs to assess the interactions between school reform variables, the status and effectiveness of implementation of various reforms, and the cost/benefit analysis related to improved student achievement.

  - conduct pilot projects or preliminary impact analyses before implementing costly school reforms in order to determine program effectiveness, costs and benefits, and possible unintended consequences.

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